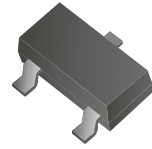


BSS138-G

N-Channel 50-V(D-S) MOSFET RoHS Device



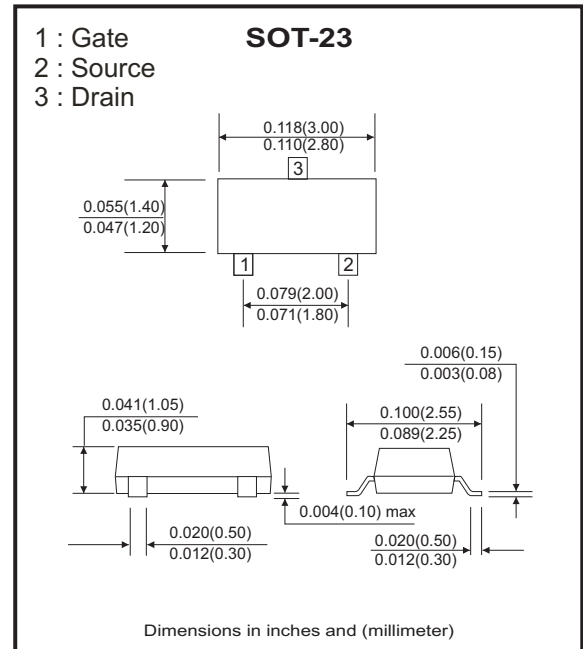
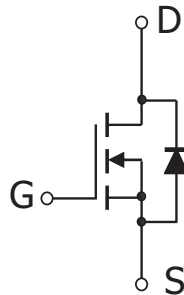
Features

- High density cell design for extremely low $R_{DS(ON)}$.
- Rugged and Reliable.

Mechanical data

- Case: SOT-23, molded plastic.
- Terminals: solderable per MIL-STD-750, method 2026.

Circuit diagram



Maximum Ratings (at $T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Units
Drain-source voltage	V_{DS}	50	V
Continuous gate-source voltage	V_{GS}	± 20	V
Continuous drain current	I_D	0.22	A
Power dissipation	P_D	0.35	W
Thermal resistance from Junction to ambient	$R_{\theta JA}$	357	$^{\circ}\text{C/W}$
Operating temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature	T_{STG}	-55 to +150	$^{\circ}\text{C}$

Company reserves the right to improve product design , functions and reliability without notice.

Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Off characteristics						
Drain-Source breakdown voltage	V _{GS} =0V, I _D =250μA	V _{(BR)DSS}	50			V
Gate-body leakage	V _{DS} =0V, V _{GS} =±20V	I _{GSS}			±100	nA
Zero gate voltage drain current	V _{DS} =50V, V _{GS} =0V	I _{DSS}			0.5	μA
	V _{DS} =30V, V _{GS} =0V	I _{DSS}			100	nA
On characteristics						
Gate-threshold voltage (note 1)	V _{DS} =V _{GS} , I _D =1mA	V _{GS(th)}	0.8		1.5	V
Static drain-source on-resistance (note 1)	V _{GS} =10V, I _D =0.22A	R _{DS(ON)}			3.5	Ω
	V _{GS} =4.5V, I _D =0.22A				6	
Forward transconductance (note 1)	V _{DS} =10V, I _D =0.22A	g _{FS}	0.12			S
Dynamic characteristics (note 2)						
Input capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	C _{iss}		27		pF
Output capacitance		C _{oss}		13		
Reverse transfer capacitance		C _{rss}		6		
Switching Characteristics						
Turn-on delay time (note 1,2)	V _{DD} =30V, V _{DS} =10V, I _D =0.29A, R _{GEN} =6Ω	t _{d(on)}			5	ns
Rise time (note 1,2)		t _r			18	
Turn-off delay time (note 1,2)		t _{d(off)}			36	
Fall time (note 1,2)		t _f			14	
Drain-source body diode characteristics						
Body diode forward voltage (note 1)	I _S =0.44A, V _{GS} =0V	V _{SD}			1.4	V

Note:

1. Pulse test ; Pulse width ≤300μs, Duty cycle ≤ 2%
2. These parameters have no way to verify.

RATING AND CHARACTERISTIC CURVES (BSS138-G)

Fig.1 - Output Characteristics

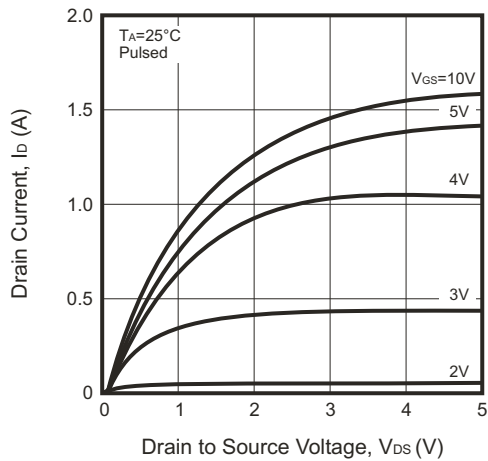


Fig.2 - Transfer Characteristics

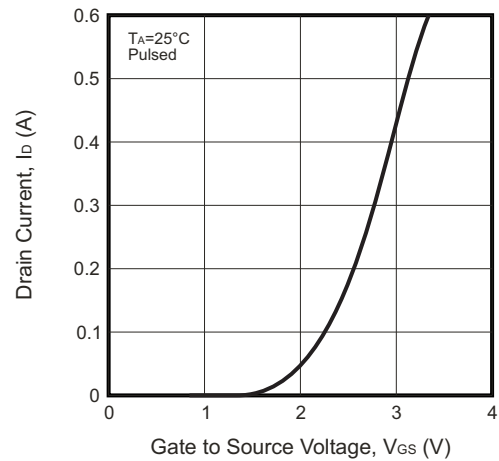


Fig.3 - $R_{DS(ON)}$ — I_D

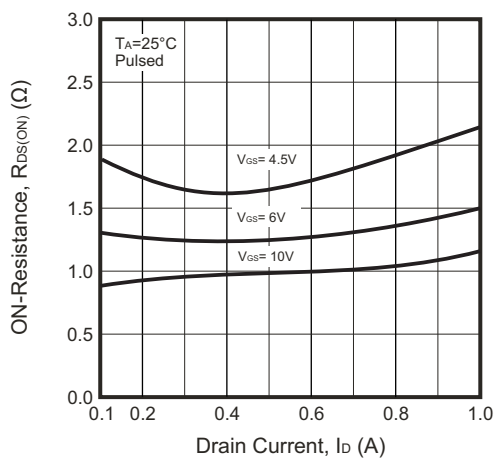


Fig.4 - $R_{DS(ON)}$ — V_{GS}

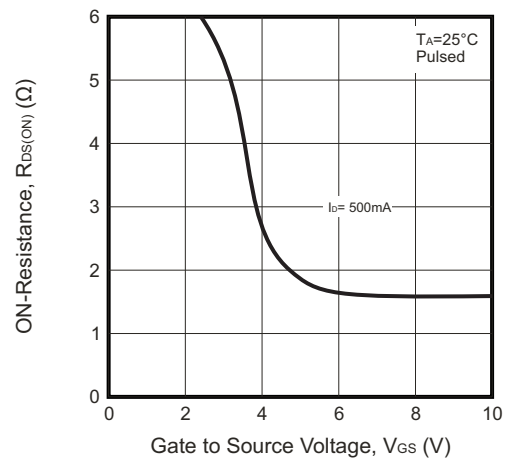
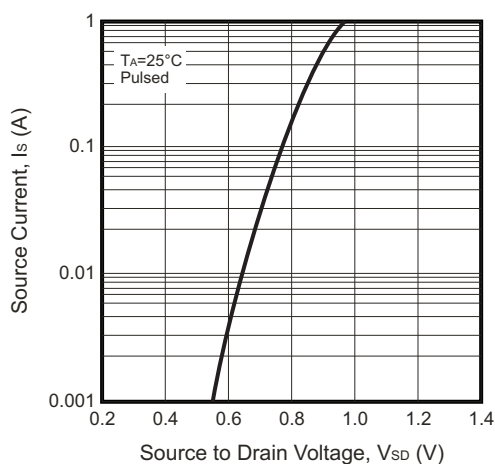
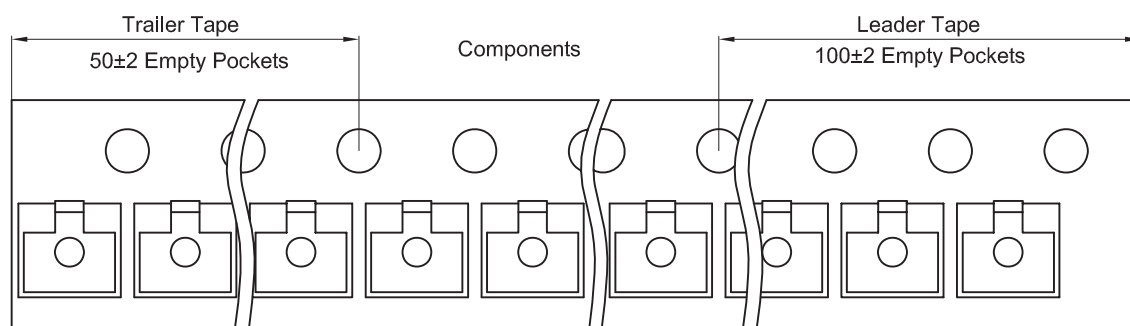
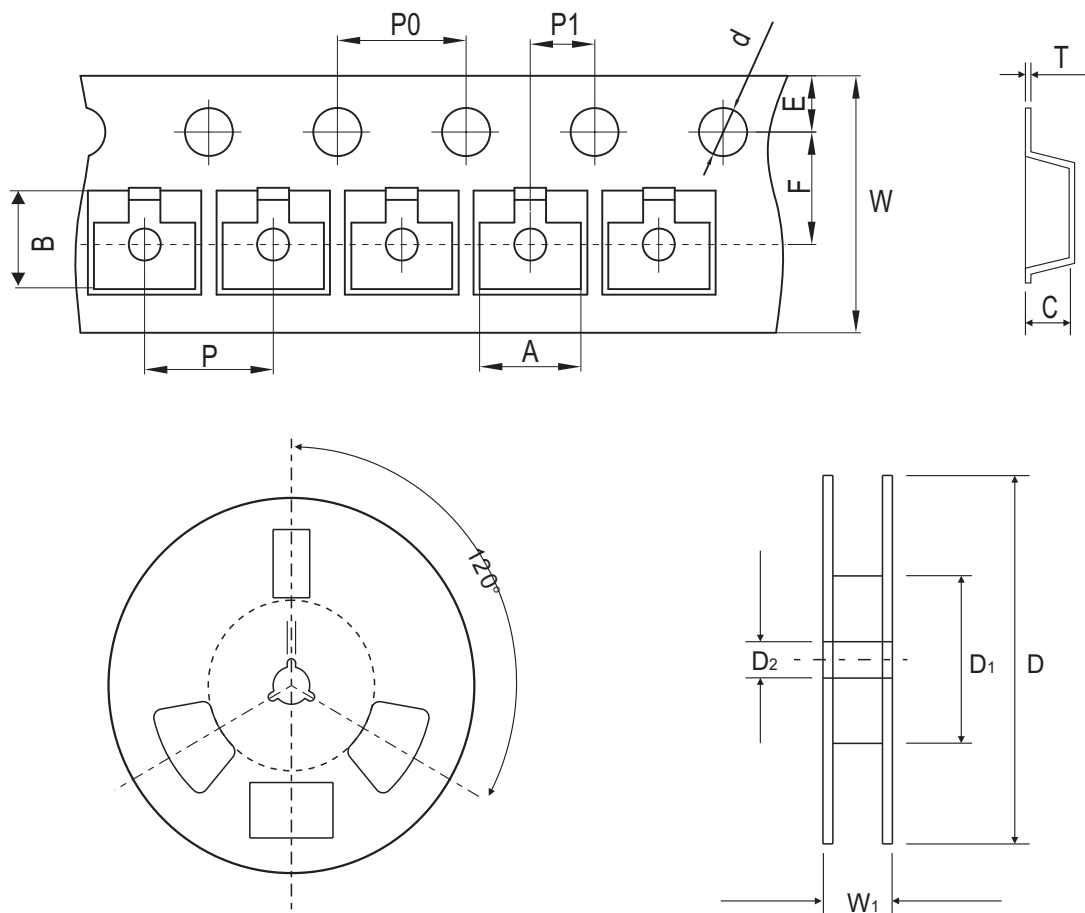


Fig.5 - I_S — V_{SD}



Reel Taping Specification

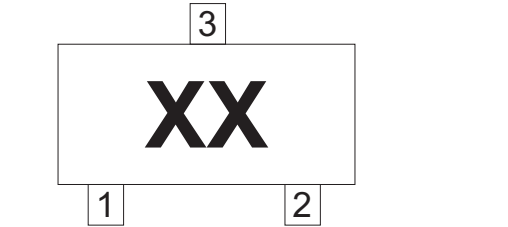


SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	$\Phi 1.50 \pm 0.10$	178 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	$\Phi 0.059 \pm 0.004$	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	$8.00 + 0.30 / - 0.10$	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	$0.315 + 0.012 / - 0.004$	0.484 ± 0.039

Marking Code

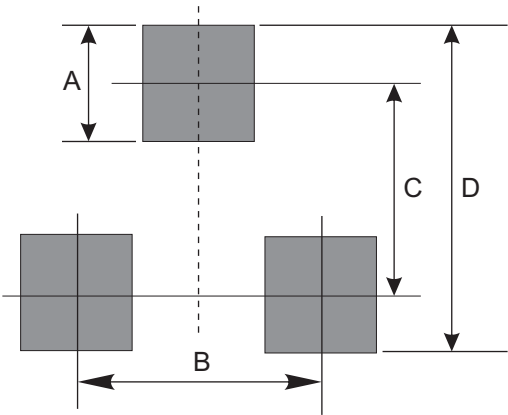
Part Number	Marking Code
BSS138-G	SS



xx = Product type marking code

Suggested PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.80	0.031
B	1.90	0.075
C	2.02	0.080
D	2.82	0.111



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7